MO Dept. of Natural Resources
Hazardous Waste Program
Jefferson City, MO

SLAAP-G
7/87

AMXTH-IR-A-153(U)

UPDATE OF THE INITIAL INSTALLATION ASSESSMENT OF ST. LOUIS ARMY AMMUNITION PLANT, ST. LOUIS, MO

J.D. Bonds, K.C. Govro, K.J. Tribbey, and K.A. Civitarese

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
P.O. Box ESE
Gainesville, FL 32602

July 1987

FINAL REPORT

Distribution limited to U.S. Government Agencies only for protection of privileged information evaluating another command: 27 July 1987. Requests for this document must be referred to: Commander's Representative, St. Louis Army Ammunition Plant, St. Louis, MO 63120-1584

Prepared for:

COMMANDER'S REPRESENTATIVE
St. Louis Army Ammunition Plant
St. Louis, MO 63120-1584
and
U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground, MD 21010-5401

2025675

Site: St. Louis Ordnance Plant
ID: MO82100224645
Break: 11.11

THE VIEWS, OPINIONS, AND/OR FINDINGS CONTAINED IN THIS REPORT ARE THOSE OF THE AUTHOR(S) AND SHOULD NOT BE CONSTRUED AS AN OFFICIAL DEPARTMENT OF THE ARMY POSITION, POLICY, OR DECISION, UNLESS SO DESIGNATED BY OTHER DOCUMENTATION.

THE USE OF TRADE NAMES IN THIS REPORT DOES NOT CONSTITUTE AN OFFICIAL ENDORSEMENT OR APPROVAL OF THE USE OF SUCH COMMERCIAL PRODUCTS. THIS REPORT MAY NOT BE CITED FOR PURPOSES OF ADVERTISEMENT.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS None
2a. SECURITY CLASSIFICATION AUTHORITY N/A	3. DISTRIBUTION / AVAILABILITY OF REPORT Requests for this document must be referred to: Commander's Representative, St. Louis Army Ammunition Plant
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE N/A	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 153(U)	5. MONITORING ORGANIZATION REPORT NUMBER(S) AMXTH-IR-A-153(U)
6a. NAME OF PERFORMING ORGANIZATION Environmental Science and Engineering, Inc.	6b. OFFICE SYMBOL (If applicable) N/A
6c. ADDRESS (City, State, and ZIP Code) P. O. Box ESE Gainesville, FL 32602-3053	7a. NAME OF MONITORING ORGANIZATION U.S. Army Toxic and Hazardous Materials Agency (USATHAMA)
	7b. ADDRESS (City, State, and ZIP Code) Assessments Division Aberdeen Proving Ground, MD 21010-5401
8a. NAME OF FUNDING / SPONSORING ORGANIZATION USATHAMA	8b. OFFICE SYMBOL (If applicable) AMXTH-IR-A
	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DAAA15-85-D-0017, Task Order 0004
8c. ADDRESS (City, State, and ZIP Code) Assessments Division Aberdeen Proving Ground, MD 21010-5401	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
N/A	N/A	N/A	N/A

11. TITLE (Include Security Classification)

Update of the Initial Installation Assessment of St. Louis Army Ammunition Plant

12. PERSONAL AUTHOR(S)
J.D. Bonds, K.C. Govro, K.J. Tribbey, and K.A. Civitarese

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM SEP1986 TO JUL1987	27 July 1987	21

16. SUPPLEMENTARY NOTATION
N/A

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
Installation Restoration Program, St. Louis Army Ammunition Plant, Initial Installation Assessment, Hazardous Waste, Contamination

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

An onsite installation assessment was conducted at St. Louis Army Ammunition Plant (SLAAP), St. Louis, MO, on 28 September 1986. The purpose of this assessment was to evaluate if environmental/hazardous waste disposal conditions had changed since the Initial Installation Assessment (IIA) was completed in 1979 and if such changes, coupled with interim changes in environmental regulations of missions, had altered the contaminant migration/hazard situation and would change the previous non-remedial investigation/feasibility study (RI/FS) recommendation. Based on the additional data obtained, the report was updated. It was recommended that USATHAMA not conduct an RI/FS at SLAAP.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL LTC Robert S. Metzger, II	22b. TELEPHONE (Include Area Code) 301/671-3921
	22c. OFFICE SYMBOL AMXTH-IR-A

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE
Unclassified

SUMMARY

An onsite installation assessment was conducted at St. Louis Army Ammunition Plant (SLAAP), St. Louis, MO, on 28 September 1986. The purpose of the assessment was to evaluate if environmental/hazardous waste disposal conditions had changed since the Initial Installation Assessment (IIA) was completed in 1979 and if such changes, coupled with interim changes in environmental regulations or missions, had altered the contaminant migration/hazard situation and would change the previous non-remedial investigation/feasibility study (RI/FS) recommendation.

The installation is under the command of U.S. Army Armament, Munitions, and Chemical Command (AMCCOM). The installation has not been involved in production activities since it was placed in layaway status in 1969. Facilities maintenance and surveillance operations are subcontracted by Donovan Construction Company to Plant Facilities and Engineering, Inc.

No problem areas were identified during the installation assessment. Therefore, it was recommended that the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) not conduct an RI/FS study at SLAAP.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AMC	U.S. Army Materiel Command
AMCCOM	U.S. Army Armament, Munitions, and Chemical Command
AVSCOM	U.S. Army Aviation Systems Command
DA	Department of the Army
DARCOM	U.S. Army Materiel Development and Readiness Command [now U.S. Army Materiel Command (AMC)]
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
ESE	Environmental Science and Engineering, Inc.
gal	gallon
ha	hectare
I-70	Interstate 70
IIA	Initial Installation Assessment
ISSA	Interservice Support Agreement
km	kilometer
mm	millimeter
PCB	polychlorinated biphenyl
POL	petroleum, oils, and lubricants
RI/FS	remedial investigation/feasibility study
SLAAP	St. Louis Army Ammunition Plant
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USGS	U.S. Geological Survey
WWII	World War II

1.0 GENERAL

1.1 PURPOSE OF THE EVALUATION

An onsite records search [Initial Installation Assessment (IIA)] was conducted at St. Louis Army Ammunition Plant (SLAAP), St. Louis, MO, in 1979 [U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), 1979] to assess past and current use of toxic and hazardous materials as well as the potential for these substances to migrate off the installation.

An evaluation of the records search (IIA) report for SLAAP was conducted in September 1986 to determine if any environmental/hazardous waste disposal conditions had changed and if such changes, coupled with interim changes in environmental regulations or mission, had altered the contaminant migration/hazard situation and would change the previous non-survey [non-remedial investigation/feasibility study (RI/FS)] recommendation.

All information concerning operations existing at the time of the original assessment was reviewed and incorporated into this report, along with new information made available to the team upon assignment of the update and by the installation at the time of the revisit.

1.2 AUTHORITY

U.S. Army Materiel Development and Readiness Command (DARCOM) Regulation 10-30, Mission and Major Functions of USATHAMA, 13 July 1984.

1.3 INTRODUCTION

1. In reviewing earlier published records search (IIA) reports (1976 to 1981), the USATHAMA Installation Restoration Division determined some installations would require additional evaluations due to changes in environmental laws, changes in mission, and environmental problems discovered after the onsite visit.

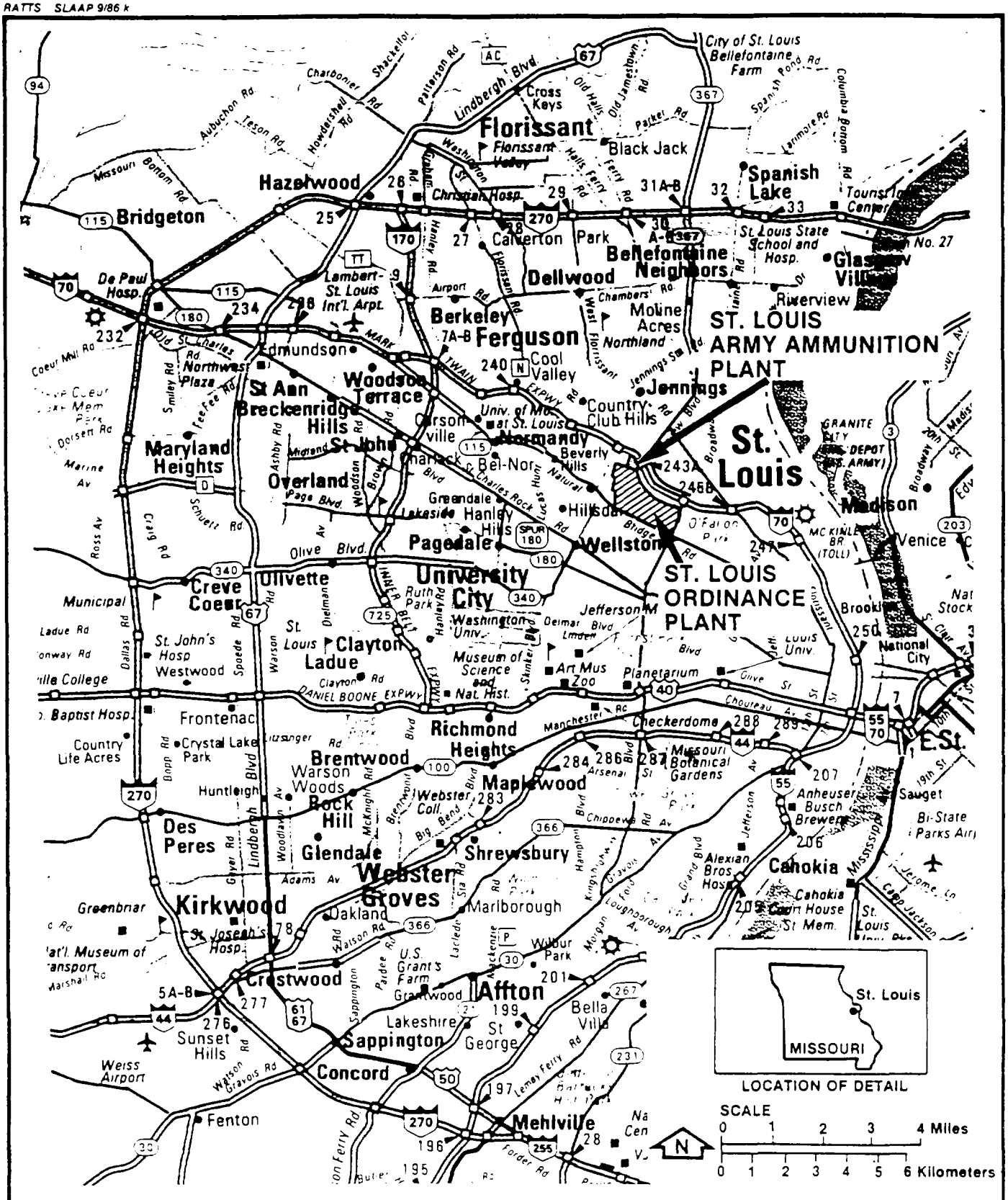
2. Subsequent to the IIA in 1979, USATHAMA has determined a report update would be required for SLAAP.
3. St. Louis Army Ammunition Plant was contacted to outline the scope of the evaluation, provide guidelines to SLAAP personnel, and obtain advance information for review by the evaluation team.
4. Installation personnel were briefed on the evaluation program on 23 September 1986, by Dr. John D. Bonds and Mr. Keith Govro from Environmental Science and Engineering, Inc. (ESE), a USATHAMA contractor.
5. Various Government agencies were contacted for documents pertinent to the evaluation effort. Agencies contacted include:
   a. U.S. Army Environmental Hygiene Agency (USAEHA) (Aberdeen Proving Ground, MD); and
   b. U.S. Environmental Protection Agency (EPA), Environmental Photographic Interpretation Center (EPIC) (Vint Hill Farms Station, Warrenton, VA).
6. The onsite phase of the evaluation was conducted on 23 September 1986. The information presented in this report is current, as of the date of the evaluation. The following personnel from ESE, under Contract No. DAAA15-85-D-0017, Delivery Order No. 0004, were assigned to the evaluation team:
   - Dr. John Bonds, Project Manager;
   - Mr. Keith Govro, Team Leader;
   - Ms. Kathy Tribbey, Document Coordinator; and
   - Ms. Kathleen Civitarese, Librarian.
7. In addition to the records review, information on SLAAP was obtained from onsite personnel (see App. A). A ground tour of SLAAP was made, and photographs were taken.
8. The installation update focused primarily on those areas identified as potential problems in the original assessment and environmental studies performed subsequent to the original site visit.

1.4 INSTALLATION HISTORY

St. Louis Army Ammunition Plant is located in the Pine Lawn area of metropolitan St. Louis, MO, approximately 5 kilometers (km) west of the Mississippi River (see Fig. 1-1). The 8.5 hectares (ha) now comprising SLAAP were originally included in the 111.7-ha area of the St. Louis Ordnance Plant. (Note: St. Louis Ordnance Plant was assessed in USATHAMA Report No. 81106, June 1981, and is not addressed in this report. The Ordnance Plant was the largest small-arms ammunition installation in the world and embodied three operating divisions: shell, core, and ammunition).

The existing plant area, a small portion of the former Ordnance Plant, originally was constructed in 1941 for the production of small-arms ammunition. With the addition of the nick-and-break area (Bldg. 1) and the forge building (Bldg. 2) in 1944, the current plant was converted from small arms to 105-millimeter (mm) projectile production (see Fig. 1-2). Other buildings in use during World War II (WWII) included Bldg. 9 (acetylene production); Bldg. 3 (machine operations); Bldg. 5 (administration); and Bldg. 6 (metallurgical laboratory).

After producing 2,500,000 projectiles for the WWII requirement, SLAAP was placed in "Standby-Under Power Extended Storage Condition" by the Chevrolet Motor Division, General Motors Corporation in September 1945. The St. Louis Ordnance District maintained SLAAP on a standby basis with civil service personnel until its reactivation on 25 March 1951 by the Chevrolet Motor Division. The SLAAP contract for production was transferred from the St. Louis Ordnance District to the St. Louis Ordnance Plant in March 1952. Production from 1951 to 1954 totalled 19,094,325 projectiles. Plant operations were terminated as of 1 May 1954. Interim maintenance was performed until 30 August 1954 when a layaway contract was approved. On 31 December 1958, the maintenance contract with General Motors was terminated, and maintenance was assumed by the United States Defense Corporation (Olin) and continued until 1966. In September 1966, Chevrolet Motor Division started reactivation of SLAAP and took over the complete operation. The first production was accepted



SOURCES: Rand McNally, 1984; ESE, 1986.

Figure 1-1
LOCATION OF ST. LOUIS ARMY AMMUNITION PLANT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

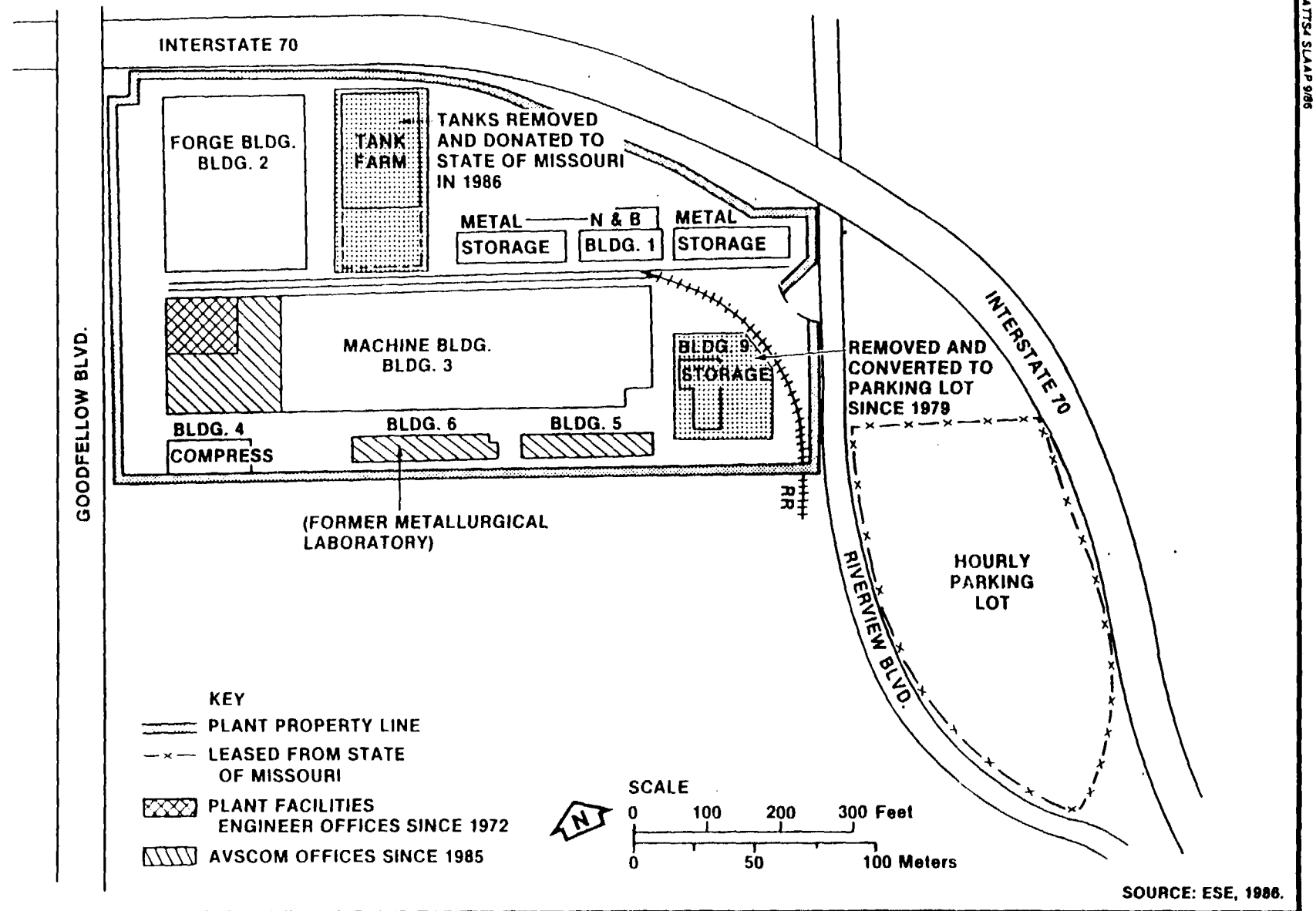


Figure 1-2
GENERAL SITE MAP OF ST. LOUIS ARMY AMMUNITION PLANT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

in November 1966. When operations were terminated in December 1969, 23,878,646 projectiles had been produced. Layaway operations were started immediately and were completed by April 1970. General Motors continued maintenance of SLAAP until February 1972.

On 1 March 1972, Donovan Construction Company of Minneapolis, MN, was awarded a contract for the maintenance and surveillance of SLAAP. Donovan Construction Company subcontracted the maintenance and surveillance of this installation to Plant Facilities and Engineering, Incorporated, immediately after award of the contract. In addition to the maintenance and surveillance contract, a companion facilities contract was executed on the same date. These contracts have been renewed annually since that time. The facilities contract was used as an instrument to procure 94 major pieces of production equipment. The equipment is stored at SLAAP pending a decision by the Department of the Army (DA) as to whether this plant should be modernized or if a new facility should be built elsewhere.

In 1984, the need for Department of Defense (DOD) office space within the St. Louis area necessitated the renovation of buildings at SLAAP and subsequent occupancy by over 500 personnel from the U.S. Army Aviation Systems Command (AVSCOM). Renovation was initiated in September 1984 and occupancy began in February 1985. Personnel from AVSCOM currently occupy Bldgs. 5 and 6 and portions of Bldg. 3 under an Interservice Support Agreement (ISSA). Personnel are involved in the writing and preparation of publications and public information material. No hazardous wastes are produced as a result of AVSCOM operations. The ISSA requires that AVSCOM vacate SLAAP facilities upon mobilization of the installation.

In 1986, SLAAP is under the command of U.S. Army Armament, Munitions, and Chemical Command (AMCCOM). Facility maintenance and surveillance continues to be subcontracted by Donovan Construction Company to Plant Facilities and Engineering, Incorporated.

2.0 CONCLUSIONS, RECOMMENDATIONS, AND CORRECTIVE ACTIONS RESULTING FROM THE 1979 INITIAL INSTALLATION ASSESSMENT OF ST. LOUIS ARMY AMMUNITION PLANT

2.1 CONCLUSIONS (PUBLISHED IN THE IIA BY USATHAMA IN 1979)

1. SLAAP is not contaminated with residual waste from past operations.
2. There is no evidence of past or present contaminant migration.

2.2 RECOMMENDATIONS (PUBLISHED IN THE IIA BY USATHAMA IN 1979)

1. No preliminary survey be conducted by USATHAMA at this time.

2.3 CORRECTIVE ACTIONS

No corrective actions were recommended at the time of the IIA.

3.0 ENVIRONMENTAL PROBLEMS IDENTIFIED AND OTHER SIGNIFICANT CHANGES SUBSEQUENT TO THE 1979 INITIAL INSTALLATION ASSESSMENT OF ST. LOUIS ARMY AMMUNITION PLANT

3.1 ENVIRONMENTAL PROBLEMS

No environmental problems have been identified at SLAAP since completion of the 1979 IIA. If the installation were reactivated, several areas would potentially require attention to comply with Federal and State of Missouri environmental regulations.

3.2 OTHER SIGNIFICANT CHANGES

3.2.1 POLYCHLORINATED BIPHENYLS (PCBs)

At the time of the IIA, transformers, capacitors, and other electrical components containing PCBs were present on SLAAP. In addition, hydraulic fluids and oils potentially contaminated with PCBs had been stored and used at SLAAP.

In 1985, all transformers, capacitors, and electrical equipment containing PCBs were removed from SLAAP. These items were transported to the Defense Reutilization and Marketing Office (DRMO) located on Scott Air Force Base (AFB), IL. All hydraulic fluids and oils were tested, and none was found to contain PCBs.

3.2.2 PETROLEUM, OILS, AND LUBRICANTS (POL) STORAGE

At the time of the IIA in 1979, POL was stored in the tank farm located east of the forge building (see Fig. 1-2). Prior to 1958, the tank farm was located north of the forge building. The tank farm was relocated east of the forge building when construction of Interstate 70 (I-70) was initiated. In 1986, the nine 18,000-gallon (gal) tanks in the tank farm area were dismantled and given to the State of Missouri. The State of Missouri relocated the tanks to St. Charles, MO, where they are being used to store asphalt.

At the time of the site visit, only the underground tanks, formerly used to store quench oils and gasoline, remained in place. All petroleum products have been removed from the three tanks used for quench oils and one tank used for gasoline storage. The tanks have been refilled with water.

No potable water wells exist within 3 miles downgradient of the installation. The St. Louis City Health Department indicated that they would monitor potable water wells if they did exist. The flow direction of SLAAP is toward the north-northeast and toward the Mississippi River.

3.2.3 SITE RENOVATION

Since the IIA, SLAAP has undergone several renovations. Building 9, formerly used for the production of acetylene gas, was razed and the area converted into a parking lot (see Fig. 1-2). In late 1984 and early 1985, Bldgs. 5 and 6 (see Fig. 1-2) were renovated and upgraded for use as office space. Building 5 was formerly used as office space during the operational phases of SLAAP. Building 6 was formerly used as a metallurgical laboratory. These buildings have been occupied since February 1985 by AVSCOM personnel.

The installation is currently in the process of renovating the electrical system supplying facility buildings. The new electrical system will accommodate the electric induction furnaces to be installed in the future renovation of the forge building. In addition, plans have been developed to replace certain portions of the manufacturing process lines upon re-activation of the facility. None of these renovation activities has generated hazardous wastes or created environmental problems for SLAAP.

3.3 SITES IDENTIFIED FROM PHOTOGRAPHIC IMAGERY

The U.S. Environmental Protection Agency's (EPA's) Environmental Photographic Interpretation Center (EPIC), under an interagency agreement

with USATHAMA, prepared a report (EPA, 1985) in which they described methods used to identify the existence of potential contamination sites on SLAAP. These methods included interpretations of ground staining, ground scarring, aboveground tanks, equipment storage areas, and other signatures which are readily recognizable to photographic imagery experts.

Possible ground stains were identified on the aerial photographs at two locations on SLAAP. Both of the areas identified were covered with concrete at the time the photographs were taken (September 1953 and October 1980). No visible ground stains were observed at these locations during the onsite visit.

No contamination sites were identified at SLAAP as a result of this study.

4.0 1986 EVALUATION OF ST. LOUIS ARMY AMMUNITION PLANT

4.1 FINDINGS

4.1.1 POLYCHLORINATED BIPHENYLS (PCBs)

All transformers, capacitors, electrical components, and hydraulic fluids and oils containing or potentially containing PCBs have been removed from SLAAP. All these items were transported to DRMO located at Scott AFB, IL by PCB, Inc., of Kansas City, MO.

4.1.2 POL STORAGE

The storage tanks in the POL tank farm were removed in the spring of 1986. The containment area remains intact. All underground storage tanks have been emptied, filled with water, and left in place. Facility personnel indicate that no spills or leaks have occurred from POL storage/handling activities.

4.1.3 SITE RENOVATION

Since the IIA, Bldg. 9 was razed. Buildings 5 and 6 were renovated for use as office space. The metallurgical laboratory formerly located in Bldg. 6 is no longer in existence. The electrical supply to SLAAP is currently being renovated and upgraded to handle electric induction furnaces which will be installed in the future. Plans have been made to replace components of the manufacturing process lines prior to any future reactivation.

4.2 CONCLUSION

Available geologic evidence and information on contaminant sources do not indicate the migration of contaminants from SLAAP by either surface or subsurface waters.

4.3 RECOMMENDATION

It is recommended that USATHAMA not conduct a remedial investigation.

ST. LOUIS ARMY AMMUNITION PLANT, ST. LOUIS, MO

REFERENCES

U.S. Army Environmental Hygiene Agency (USAEHA). 1982. Radiation Protection Survey No. 28-43-0251-82, U.S. Army Health Clinic/Dental Clinic, St. Louis, MO. Aberdeen Proving Ground, MD.

U.S. Army Environmental Hygiene Agency (USAEHA). 1982. Radiation Protection Survey No. 28-43-0252-82, Military Entrance Processing Station, St. Louis, MO. Aberdeen Proving Ground, MD.

U.S. Army Environmental Hygiene Agency (USAEHA). 1982. Installation Pest Management Program Review No. 16-62-0524-82, St. Louis Army Ammunition Plant, St. Louis, MO. Fort McPherson, GA.

U.S. Army Materiel Command (AMC). 1986. Environmental Compliance Audit Program. Final Audit Report St. Louis Army Ammunition Plant, St. Louis, MO. Prepared for U.S. Army Engineer Division, Huntsville, AL, by PRC Engineering.

U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). 1979. Installation Assessment of St. Louis Army Ammunition Plant. Aberdeen Proving Ground, MD. Report No. 153.

U.S. Geological Survey (USGS). 1954, Photorevised 1968 and 1974. Clayton, MO (7.5-minute series topographic map). Reston, VA.

U.S. Environmental Protection Agency (EPA). Environmental Photographic Interpretation Center (EPIC). 1985. Installation Assessment Relook Program Working Document, St. Louis Army Ammunition Plant and St. Louis Ordnance Plant, St. Louis, MO. Warrenton, VA. Prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, MD. TS-PIC-85X.

APPENDIX A

PERSONNEL CONTACTED

Name	Title
Merle Humphries	Commander's Representative
John T. Darr	Engineering Supervisor (Plant Facilities and Engineering--Subcontractor Operating SLAAP)